AMENDMENTS TO THE CLAIMS:

Please delete claims 1, 4, 6-10, 13 and 15-17 without prejudice to or disclaimer of the subject matter contained therein. Applicant reserves the right to file a divisional application and pursue these claims.

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Cancelled).

2. (Currently Amended) A point diffraction interferometer which measures a surface profile of a surface to be measured by, irradiating a light ~~irradiated~~ from a light source to a pinhole mirror via a collective optical system, irradiating a part of the light diffracted from a pinhole provided in the pinhole mirror to said surface to be measured as a luminous flux for measurement, making said luminous flux for measurement reflected by the surface to be measured interfere with a reference luminous flux which is an other part of the light diffracted from said pinhole, and detecting the state of an interference fringe caused by the interference,

wherein a range of a numerical aperture of said collective optical system is:

$NA \leq \lambda/\phi PH$,

wherein:

$0 < NA < 1$; ~~wherein~~

λ is a wavelength of light irradiated from said light source;

NA is a numerical aperture of said collective optical system; and

ϕ PH is a diameter of said pinhole.

3. (Currently Amended) A point diffraction interferometer which measures a surface profile of a surface to be measured by, irradiating a light ~~irradiated~~ from a light source to a pinhole mirror via a collective optical system, irradiating a part of the light

diffracted from a pinhole provided in the pinhole mirror to said surface to be measured as a luminous flux for measurement, making said luminous flux for measurement reflected by the surface to be measured interfere with a reference luminous flux which is an other part of the light diffracted from said pinhole, and detecting the state of an interference fringe caused by the interference,

B' Cont'd

wherein the light irradiated onto said pinhole is an elliptically polarized light that satisfies the following condition:~~, and~~

$0.5 < \varepsilon < 2$,

wherein ε is an ellipticity represented as ~~(~~a ratio of a minor axis to a major axis~~)~~.

4. (Cancelled).

5. (Currently Amended) A point diffraction interferometer ~~according to claim 4, wherein~~ which measures a surface profile of a surface to be measured by, irradiating a light from a light source to a pinhole mirror via a collective optical system, irradiating a part of the light diffracted from a pinhole provided in the pinhole mirror to said surface to be measured as a luminous flux for measurement, making said luminous flux for measurement reflected by the surface to be measured interfere with a reference luminous flux which is an other part of the light diffracted from said pinhole, and detecting a state of an interference fringe caused by the interference, wherein:

_____ said pinhole mirror has a transparent substrate, a first reflection coating and a second reflection coating comprising said pinhole, formed sequentially on the transparent substrate; and

_____ when said pinhole diameter is 0.5 μm or larger, the following conditions are satisfied:

$0.5 \leq \gamma < 1$; and

$\phi = \Delta + 360° \times N$,

wherein:

~~(~~$-45° \leq \Delta \leq 45°$ ~~,~~;

N = an integer~~),~~; ~~wherein~~

γ is an internal reflectivity of said pinhole represented as a ~~(~~reflection by the first reflection coating~~)~~ / an external reflectivity of said pinhole represented as a ~~(~~reflection by the second reflection coating~~),~~; and

ϕ is a phase difference between the internal reflectivity and the external reflectivity of said pinhole.

6. (Cancelled).

7. (Cancelled).

8. (Cancelled).

9. (Cancelled).

10. (Cancelled).

11. (Currently Amended) A manufacturing method for a reflecting mirror in which a multilayer film is formed ~~obtained~~ by alternately laminating a heavy element layer and a light element layer on a substrate ~~is formed~~, comprising:

~~comprising at least a step for~~ measuring a surface profile, using ~~a~~ the point diffraction interferometer according to claim 2.

12. (Currently Amended) A manufacturing method for a reflecting mirror in which a multilayer film is formed ~~obtained~~ by alternately laminating a heavy element layer and a light element layer on a substrate ~~is formed~~, comprising:

~~comprising at least a step for~~ measuring a surface profile, using ~~a~~ the point diffraction interferometer according to claim 3.

13. (Cancelled).

14. (Currently Amended) A manufacturing method for a reflecting mirror in which a multilayer film if formed ~~obtained~~ by alternately laminating a heavy element layer and a light element layer on a substrate ~~is formed~~, comprising:

~~comprising at least a step for~~ measuring a surface profile, using ~~a~~ the point diffraction interferometer according to claim 5.

15. (Cancelled).

16. (Cancelled).

17. (Cancelled).

18. (New) A projection exposure apparatus comprising:

an illumination optical system which illuminates a mask by soft X-rays; and

a projection optical system which projects a pattern formed on said mask onto a photosensitive substrate for exposure,

wherein said illumination optical system or said projection optical system comprises the reflecting mirror manufactured by the manufacturing method for the reflecting mirror according to claim 12.

AMENDMENTS TO THE DRAWINGS:

The attached sheet of drawings includes changes to Figs. 6-7. This sheet, which includes Figs. 6-7, replaces the original sheets including Figs. 6-7.

Figs. 6 and 7 have been amended to include the label "PRIOR ART"

Attachment: Replacement Sheet